

ABSTRACT

A method and apparatus for ensuring fair and efficient use of a shared memory buffer. A preferred embodiment comprises a shared memory buffer in a multi-processor computer system. Memory requests from a local processor are delivered to a local memory controller by a cache control unit and memory requests from other processors are delivered to the memory controller by an interprocessor router. The memory controller allocates the memory requests in a shared buffer using a credit-based allocation scheme. The cache control unit and the interprocessor router are each assigned a number of credits. Each must pay a credit to the memory controller when a request is allocated to the shared buffer. If the number of filled spaces in the shared buffer is below a threshold, the buffer immediately returns the credits to the source from which the credit and memory request arrived. If the number of filled spaces in the shared buffer is above a threshold, the buffer holds the credits and returns the credits in a round-robin manner only when a space in the shared buffer becomes free. The number of credits assigned to each source is sufficient to enable each source to deliver an uninterrupted burst of memory requests to the buffer without having to wait for credits to return from the buffer. The threshold is the point when the number of free spaces available in the buffer is equal to the total number of credits assigned to the cache control unit and the interprocessor router.